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KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR
END SEMESTER EXAMINATION
FOR THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE
KCS 304 – COMPUTER ARCHITECTURE

Date: 17TH APRIL 2023
Time: 2:30PM – 4:30PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

a) Differentiate between computer architecture and computer organization. (3 Marks)

b) Define the term microprocessor and why is viewed as programmable device. (2 Marks)

c) To process an instruction a central processing unit(CPU) goes through a cycle that has three main stages. Name each stage in the cycle. (3 Marks)

d) Name the four components that make up a modern computer as first developed in Von-Neuman machine. For each case give the function. A neat diagram should accompany the description. (5 Marks)

e) Define the following acronyms and terms as used in computer architecture (5 Marks)
   i) ISA.
   ii) RISC
   iii) a chip
   iv) Interrupt cycle
   v) CISC

f) A technician for a small company set a BIOS password on every computer. The technician left the company, and the replacement technician needs to access the BIOS. What should the new technician do? (2 Marks)

g) What is Moore's law. Explain the consequences of Moore's law. (3 Marks)

h) Differentiate between the following expression used in computer system. (4 Marks)
   i) CMOS and Cache
   ii) North bridge and Southern bridge
   iii) SSI and VLSI

i) Give the function of the following part of a computer. (3 Marks)
   i) Motherboard
   ii) A shift Registers
   iii) Virtual Memory

QUESTION TWO (20 MARKS)

a) With the aid of a well -labelled diagram, describe the structure of the IAS Computer designed by John von Neumann (6 Marks)

b) In the von Neumann model, explain the purpose of the processing unit and the program counter. (4 Marks)

c) Explain how RISC and CISC architecture differ (4 Marks)

d) Define instruction pipe-lining with help of six stage diagram (6 Marks)

QUESTION THREE (20 MARKS)

a) Discuss the function of FOUR major components of a processor (8 Marks)
b) State and explain the FOUR main structural components of a computer (8 Marks)
c) State and explain two elements of a machine instruction (4 Marks)

QUESTION FOUR (20 MARKS)

a) Discuss the advantages of assembly language and disadvantage of using an assembly language over Higher Level Languages (10 Marks)
b) State and explain FIVE common addressing techniques. (10 Marks)

QUESTION FIVE (20 MARKS)

a) Computer memory can be classified according to its key characteristics. State and briefly explain the classification of memory according to the location and access method. (12 Marks)
b) State and explain two types of parity checking in error detection (4 Marks)
c) With the aid of diagrams, explain the operation of each type in b) above (4 Marks)